



ISSUED BY
RPP-WTP PDC
INIT DATE

Document title:

System Logic Description for the Low-Activity Waste Facility - Radioactive Liquid Waste Disposal (RLD) System

Contract number: DE-AC27-01RV14136
Department: Controls and Instrumentation
Author(s): EL Vodopest

Principal author
signature:

El Vodopest

Document number: 24590-LAW-PER-J-02-001, Rev 1

Checked by: DF Queen

Checker signature:

DF Queen 4-21-04

Date of issue: 21 April 2004

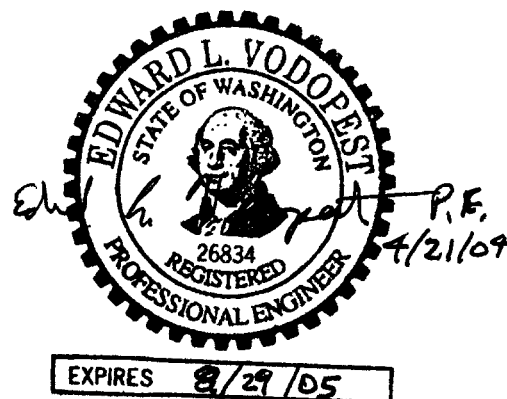
Issue status: Issued for Permitting Use

Approved by: SE Anderson

Approver's position: C&I Engineering Manager

Approver signature:

S. E. Anderson



This bound document contains a total of 17 sheets

River Protection Project
Waste Treatment Plant
2435 Stevens Center Place
Richland, WA 99352
United States of America
Tel: 509 371 2000

Notice

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the US Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts that, pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

History Sheet

Rev	Date	Reason for revision	Revised by
0	10 October 2002	Issued for Permitting Use	LWO/NJS
1	21 April 2004	Issued for Permitting Use	EL Vodopest

Contents

Notice.....	ii
History Sheet	iii
Glossary	v
Acronyms and Abbreviations	vi
1 Introduction	1
2 Applicable Documents.....	1
3 Description	1
3.1 Below Grade System Requirements	1
3.2 Above Grade System Requirements	3

Figures

Figure 1	RLD-LT-2205 and RLD-LT-2206 for RLD-VSL-00004.....	8
Figure 2	Level for Sumps.....	9
Figure 3	RLD-LT-2130 and RLD-LT-2131 for RLD-VSL-00003.....	10
Figure 4	RLD-LT-2142 and RLD-LT-2143 for RLD-VSL-00005.....	11

Glossary

Acquire	A command, under batch control, that reserves a group of equipment for that particular batch control.
Actual Volume	Volume of waste/process fluid in any vessel in gallons.
Available Space	Volume of waste/process fluid that any vessel can accommodate and still be lower than the upper operating limit (UOL), in gallons. Available space can be calculated as follows: <i>Available Space = UOL - Actual Volume</i> .
Available Volume	Volume of waste/process fluid that any vessel can transfer to another vessel and still be above the lower operating limit (LOL), in gallons. Available volume can be calculated as follows: <i>Available Volume = Actual Volume - LOL</i> .
Batch	The material that is being produced or that has been produced by a single execution of a batch process.
Batch Control	Control activities and control functions that provide a means to process (that is, an ordered set of processing activities) finite quantities of material over a finite period of time using one or more pieces of equipment.
Batch Process	A process that leads to the production of finite quantities of material by subjecting quantities of input material to an ordered set of processing activities over a finite period of time using one or more pieces of equipment.
Exception Handling	Those functions that deal with plant or process contingencies and other events that occur outside the normal or desired behavior of batch control.
Permissive	Interlock that allows a device to change state or a sequence to start. Once a device has changed state or a sequence has started, permissives have no further effect on the device or sequence.
Release	A command under a batch control that opens up a group of equipment for any batch control to acquire.
Trip	Interlock that does not allow a device to change state or a sequence to start. Once a device has changed state or a sequence has started, trips continue to have an effect on the device or sequence.

Acronyms and Abbreviations

AEA	Atomic Energy Act of 1954
DOE	US Department of Energy
HS	hand switch
LALL	level alarm low low
LAHH	level alarm high high
LAW	low-activity waste
LI	level indicator
LKI	level computation indicator
LKY	level computation relay
LSHH	level switch high high
LSLL	level switch low low
LT	level transmitter
LY	level relay
PCJ	process control system
PT	pretreatment (facility)
RLD	radioactive liquid waste disposal system
SBS	submerged bed scrubber

1 Introduction

This document describes the instrument control logic for tank and ancillary equipment for the Radioactive Liquid Waste Disposal System (RLD) in the low-activity waste (LAW) facility associated with dangerous waste management.

2 Applicable Documents

WAC 173-303, *Dangerous Waste Regulations*, Washington Administrative Code, as amended.

3 Description

3.1 Below Grade System Requirements

The tank and ancillary equipment associated with dangerous waste management in the LAW system and residing below the 0 ft elevation of the RLD system follow:

- RLD-VSL-00004 C3/C5 drains/sump collection vessel
- RLD-BULGE-00001 C3/C5 drains/sump collection pump bulge
- RLD-SUMP-00028 RLD-VSL-00004 cell sump

3.1.1 C3/C5 Drains/Sump Collection Vessel RLD-VSL-00004

The C3/C5 drains/sump collection vessel (RLD-VSL-00004) is at the -21 ft elevation in an enclosed C3/C5 cell area, room L-B001B. The vessel overflows to sump RLD-SUMP-00028 in the same cell. This sump is evacuated by pump RLD-PMP-00004 and transferred to the plant wash vessel (RLD-VSL-00003), at the 2 ft elevation.

The C3/C5 drains/sump collection vessel (RLD-VSL-00004) and cell are designed to contain the maximum amount of fire protection water necessary to cover the largest C3/C5 area. If a fire activates the sprinkler system, the firewater will drain into the vessel through floor drains. If the volume reaches the overflow level during off-normal operation, the contents will overflow onto the floor of the C3/C5 cell at the -21 ft elevation. The C3/C5 cell contains a stainless steel liner, to provide secondary containment.

The C3/C5 drains/sump collection vessel (RLD-VSL-00004) is constructed of 6 % molybdenum stainless steel and collects a constant liquid purge, gravity drained from the wet electrostatic precipitators (LOP-WESP-00001 and LOP-WESP-00002), located at 2 ft elevation. The overflow from the concentrate receipt vessels (LCP-VSL-00001 and LCP-VSL-00002), at the 2 ft elevation, and the melter feed preparation vessels (LFP-VSL-00001 and LFP-VSL-00003), also at the 2 ft elevation, is routed to this vessel. The C3/C5 drains/sump collection vessel (RLD-VSL-00004) is vented into a common vessel ventilation header system, which returns drains back into the same vessel.

The C3/C5 drains/sump collection vessel (RLD-VSL-00004) level is continuously monitored by redundant level transmitters RLD-LT-2205 and RLD-LT-2206. At a predetermined setpoint, the operator is notified that effluent level has risen to a point where transfer is required. The operator then selects the target vessel and initiates the transfer sequence. Once initiated, the process control system (PCJ) verifies

that all instruments, utilities, and equipment associated with the transfer are within operational parameters. Next, an automated process sample is taken to document solids content and effluent characteristics. Before the sequence proceeds further, the PCJ system calculates the transfer volume to ensure that the effluent volume will not overflow the selected target vessel (plant wash vessel RLD-VSL-00003 or submerged bed scrubber [SBS] condensate collection vessel RLD-VSL-00005). If the volume to be transferred exceeds the volume of the target vessel, the PCJ system will not allow the transfer to occur; the sequence will be placed on hold awaiting resolution and restart by Operations. The transfer will end when either the level in the C3/C5 drains/sump collection vessel (RLD-VSL-00004) reaches its low-level control point or the selected target vessel reaches its high-level control point.

To prevent a possible overflow and loss of primary containment, the PCJ system alarms at two high-level setpoints. At high-level setpoint, the PCJ system initiates a high alarm and alerts the operator. At high-high level setpoint, the PCJ system initiates a critical alarm and alerts the operator. Figure 1 depicts the instrumentation associated with the C3/C5 drains/sump collection vessel (RLD-VSL-00004).

3.1.2 C3/C5 Drains/Sump Collection Pump Bulge RLD-BULGE-00001

The C3/C5 drains/sump collection vessel (RLD-VSL-00004) is connected by through-wall piping to the C3/C5 drains/sump collection pump bulge (RLD-BULGE-00001), which is equipped with recirculation/transfer pumps (RLD-PMP-00002A/B). The recirculation/transfer pump discharge is routed to the vessel mixing eductors to maintain solids in constant suspension.

The C3/C5 drains/sump collection transfer pumps (RLD-PMP-00002A/B) are centrifugal pumps contained in the C3/C5 drains/sump collection pump bulge. Pump discharge can be routed to either SBS condensate collection vessel (RLD-VSL-00005) or plant wash vessel (RLD-VSL-00003), both at 2 ft elevation. Sampling capability is provided using a sampling leg off the pump recirculation line to autosampler unit (ASX-SMPLR-00013).

3.1.3 RLD-VSL-00004 Cell Sump RLD-SUMP-00028

C3/C5 drains/sump collection vessel (RLD-VSL-00004) overflows to RLD-VSL-00004 cell sump (RLD-SUMP-00028), located in the same cell. As required, on a semi-automatic basis, this sump is emptied by RLD-VSL-00004 cell sump pump (RLD-PMP-00004) to the plant wash vessel (RLD-VSL-00003), at the 2 ft elevation.

To detect an overflow from C3/C5 drains/sump collection vessel (RLD-VSL-00004) or a leak outside of the primary containment vessel and within the C3/C5 cell, level instrument RLD-LT-2233 monitors the level of effluent in the cell sump. At high level, the PCJ system will alert the operator. The operator may then initiate the transfer sequence. At the high-high level setpoint, the PCJ system automatically initiates the transfer sequence. However, in both cases, before a transfer can proceed, the PCJ system calculates transfer volume to ensure that the volume will not overflow the plant wash vessel (RLD-VSL-00003). If the volume to be transferred exceeds the volume of the plant wash vessel (RLD-VSL-00003), the PCJ system will not allow the transfer to occur; the sequence will be placed on hold awaiting resolution. Additionally, the PCJ system monitors and calculates rate of change ("rate of rise") of the effluent level. If the rate of change exceeds a predetermined programmed value, the PCJ system will alarm and alert the operator. RLD-VSL-00004 cell sump pump (RLD-PMP-00004) is stopped on reaching low-low level shut-off point. Figure 2 depicts the instrumentation associated with RLD-VSL-00004 cell sump (RLD-SUMP-00028).

3.2 Above Grade System Requirements

The tank and ancillary equipment associated with dangerous waste management in the LAW system and residing above the 0 ft elevation of the RLD system follow:

- RLD-VSL-00003 plant wash vessel
- RLD-VSL-00005 SBS condensate collection vessel
- RLD-BULGE-00004 plant wash/SBS condensate collection vessel valve bulge
- RLD-SUMP-00029 L-0123 process cell waste disposal west sump
- RLD-SUMP-00030 L-0123 process cell waste disposal east sump
- RLD-SUMP-00031 L-0124 process cell waste disposal west sump
- RLD-SUMP-00032 L-0124 process cell waste disposal east sump
- RLD-SUMP-00035 L-0126 effluent cell waste disposal west sump
- RLD-SUMP-00036 L-0126 effluent cell waste disposal east sump

3.2.1 Plant Wash Vessel RLD-VSL-00003

The plant wash vessel (RLD-VSL-00003) is at the 2 ft elevation in an enclosed wet process C5 cell, room L-0126. The vessel overflows via overflow line to the C3/C5 drains/sump collection vessel (RLD-VSL-00004) in another cell, room L-B001B, at the -21 ft elevation.

The effluent cell, room L-0126, supports a stainless steel liner sized to provide secondary containment. The welded vessel, process cell containment, and the overflow system meet the requirement to minimize system leaks.

The plant wash vessel (RLD-VSL-00003) is constructed of 6 % molybdenum stainless steel alloy. The plant wash vessel (RLD-VSL-00003) receives off-specification feed from the concentrate receipt vessels (LCP-VSL-00001 and LCP-VSL-00002); effluent from the SBS condensate collection vessel (RLD-VSL-00005) under off-normal operations; off-specification effluents from the C1/C2 drains/sump collection vessel (NLD-VSL-00005); drains from the caustic collection vessel (LVP-VSL-00001) berm; effluent from the C3/C5 drains/sump collection vessel (RLD-VSL-00004); overflow from the SBS condensate collection vessel (RLD-VSL-00005); sump discharges from process cells L-0123 and L-0124 and effluent cell L-0126; and plant wash vessel (RLD-VSL-00003) vessel washings. During a batch process, if the plant wash vessel mechanical agitator (RLD-AGT-00001) receives permissives to operate, the vessel contents are agitated to provide a representative sample. The vessel is vented via a vessel ventilation header into the LAW secondary offgas/vessel vent process system (LVP) that connects to the C3/C5 drains/sump collection vessel (RLD-VSL-00004).

The plant wash vessel (RLD-VSL-00003) level is continuously monitored by redundant level transmitters RLD-LT-2130 and RLD-LT-2131. The operator selects the primary transmitter. This actual level signal inputs to the functional logic and batch controls and calculates actual volume. The PCJ system monitors effluent level to control transfers. As part of the batch control, the operator releases and acquires the target vessel pretreatment (PT) plant wash vessel (PWD-VSL-00044) and initiates the collected effluent transfer sequence using a plant wash vessel discharge pump (RLD-PMP-00001A or RLD-PMP-00001B).

Once initiated, the PCJ system verifies that all instruments, utilities, and equipment associated with the transfer are within operational parameters. Next, an automated process sample may be taken to document

solids content and effluent characteristics. Before the sequence proceeds further, the PCJ system calculates transfer (available) volume to assist the operator and verify that the slurry volume will not overflow the selected target vessel available space. The transfer will end when the level in the plant wash vessel (RLD-VSL-00003) reaches its low-level functional logic control point, a batch is transferred, or the selected target vessel reaches its actual high-level batch control point. Low-low level trips will stop the plant wash vessel mechanical agitator (RLD-AGT-00001) and plant wash vessel discharge pumps (RLD-PMP-00001A or RLD-PMP-00001B).

To prevent a possible overflow, the PCJ system alarms at two high-level setpoints. At high-level setpoint, the PCJ system initiates a high alarm and alerts the operator. At high-high level setpoint, the PCJ system initiates a critical alarm and alerts the operator. Additionally, a high-high level during a procedural transfer from the RLD-VSL-00004 cell, process cells L-0123 and L-0124, and effluent cell L-0126 sumps will initiate exception handling to mitigate plant wash vessel (RLD-VSL-00003) overflow. Figure 3 depicts the instrumentation associated with the plant wash vessel (RLD-VSL-00003).

3.2.2 SBS Condensate Collection Vessel RLD-VSL-00005

The SBS condensate collection vessel (RLD-VSL-00005) is at the 2 ft elevation in an enclosed effluent C5 cell, room L-0126. The vessel overflows via overflow line to the plant wash vessel (RLD-VSL-00003) in the same cell.

The effluent cell, room L-0126, supports a stainless steel liner sized to provide secondary containment. The welded vessel, process cell containment, and the overflow system meet the requirement to minimize system leaks.

The SBS condensate collection vessel (RLD-VSL-00005) is constructed of 6 % molybdenum stainless steel alloy. The SBS condensate collection vessel (RLD-VSL-00005) receives SBS column purge effluent from the melter 1 SBS (LOP-SCB-00001), melter 2 SBS (LOP-SCB-00002), melter 1 SBS condensate vessel (LOP-VSL-00001), and melter 2 SBS condensate vessel (LOP-VSL-00002). During a batch process, if the SBS condensate mechanical agitator (RLD-AGT-00002) receives permissives to operate, the vessel contents are agitated to provide a representative sample. The vessel is vented via a vessel ventilation header into the LAW secondary offgas/vessel vent process system (LVP) that connects to the C3/C5 drains/sump collection vessel (RLD-VSL-00004).

The SBS condensate collection vessel (RLD-VSL-00005) level is continuously monitored by redundant level transmitters RLD-LT-2142 and RL-LT-2143. The operator selects the primary transmitter. This actual level signal inputs to the functional logic and batch controls and calculates actual volume. The PCJ system monitors effluent level to control batch transfers. As part of the batch control, the operator releases and acquires the target vessel PT LAW SBS condensate receipt vessel (TLP-VSL-00009A) or PT LAW SBS condensate receipt vessel (TLP-VSL-00009B) and initiates the transfer sequence using a RLD-VSL-00005 discharge pump (RLD-PMP-00003A or RLD-PMP-00003B).

Once initiated, the PCJ system verifies that all instruments, utilities, and equipment associated with the transfer are within operational parameters. Next, an automated process sample may be taken to document solids content and effluent characteristics. Before the sequence proceeds further, the PCJ system calculates transfer (available) volume to assist the operator and verify that the slurry volume will not overflow the selected target vessel available space. The transfer will end when the level in the SBS condensate collection vessel (RLD-VSL-00005) reaches its low-level functional logic control point, a batch is transferred, or the selected target vessel reaches its actual high-level batch control point.

Low-low level trips will stop the SBS condensate mechanical agitator (RLD-AGT-00002) and RLD-VSL-00005 discharge pumps (RLD-PMP-00003A or RLD-PMP-00003B).

To prevent a possible overflow, the PCJ system alarms at two high-level setpoints. At the high-level setpoint, the PCJ system initiates a high alarm and alerts the operator. At the high-high level setpoint, the PCJ system initiates a critical alarm and alerts the operator. Additionally, a high-high level during a procedural transfer from another vessel will initiate exception handling to mitigate SBS condensate collection vessel (RLD-VSL-00005) overflow. Figure 4 depicts the instrumentation associated with the SBS condensate collection vessel (RLD-VSL-00005).

3.2.3 Plant Wash/SBS Condensate Collection Vessel Valve Bulge RLD-BULGE-00004

The plant wash/SBS condensate collection vessel valve bulge (RLD-BULGE-00004) is at the 28 ft elevation in the process cell charge floor C3 area, room L-0202. The plant wash/SBS condensate collection vessel valve bulge (RLD-BULGE-00004) is connected by through-floor piping back down to plant wash vessel (RLD-VSL-00003) and SBS condensate collection vessel (RLD-VSL-00005). The two inter-facility transfer lines from the LAW facility are cross-connected at the plant wash/SBS condensate collection vessel valve bulge (RLD-BULGE-00004) via a normally closed valve, and are also cross-connected inside the PT facility via normally closed valves in the hot cell to the PT plant wash vessel (PWD-VSL-00044) and the PT LAW SBS condensate receipt vessels (TLP-VSL-00009A/B).

Plant wash vessel (RLD-VSL-00003) effluent is primarily discharged via a single wall line up to the plant wash/SBS condensate collection vessel valve bulge (RLD-BULGE-00004), continues to the C3/C5 drain collection cell room L-B001B at the -21 ft elevation, then via coaxial lines to the PT plant wash vessel (PWD-VSL-00044), at the PT facility.

SBS condensate collection vessel (RLD-VSL-00005) effluent is primarily discharged via a single wall line up to the plant wash/SBS condensate collection vessel valve bulge (RLD-BULGE-00004), continues to the C3/C5 drain collection cell room L-B001B at the -21 ft elevation, then via coaxial lines to the LAW SBS condensate receipt vessels (TLP-VSL-00009A/B), at the PT facility.

During off-normal operation, any bulge drain volume contents will overflow via through-floor piping into the L-0126 effluent cell waste disposal west sump (RLD-SUMP-00035), at the 2 ft elevation in the enclosed effluent cell, room L-0126.

3.2.4 Process Cells Waste Disposal Sumps

Melter 1 valve bulge (LOP-BULGE-00001) and concentrate receipt valve bulges (LCP-BULGE-00001 and LCP-BULGE-00002), at the 28 ft elevation in the process cell charge floor C3 area, room L-0202, drain by through-floor piping back down to L-0123 process cell waste disposal west sump (RLD-SUMP-00029). As required, on a semi-automatic basis, this sump is emptied by L-0123 process cell west sump pump (RLD-PMP-00025) to the plant wash vessel (RLD-VSL-00003) at the 2 ft elevation in wet process C5 cell, room L-0126. To detect a leak outside of the primary containment vessels and within the C5 cell, level instrument RLD-LT-2301 monitors the level of effluent in the cell sump. L-0123 process cell west sump pump (RLD-PMP-00025) is stopped on reaching low-low level shut-off point.

Melter 1 feed/prep valve bulge (LFP-BULGE-00001), at the 28 ft elevation in the process cell charge floor C3 area, room L-0202, and the melter 1 feed line encasement all drain to L-0123 process cell waste disposal east sump (RLD-SUMP-00030). As required, on a semi-automatic basis, this sump is emptied by L-0123 process cell east sump pump (RLD-PMP-00026) to the plant wash vessel (RLD-VSL-00003)

at the 2 ft elevation in wet process C5 cell, room L-0126. To detect drain accumulation or leak outside of the primary containment vessels and within the C5 cell, level instrument RLD-LT-2302 monitors the level of effluent in the cell sump. L-0123 process cell east sump pump (RLD-PMP-00026) is stopped on reaching low-low level shut-off point.

Melter 2 valve bulge (LOP-BULGE-00002), at the 28 ft elevation in the process cell charge floor C3 area, room L-0202, drains by through-floor piping back down to L-0124 process cell waste disposal west sump (RLD-SUMP-00031). As required, on a semi-automatic basis, this sump is emptied by L-0124 process cell west sump pump (RLD-PMP-00027) to the plant wash vessel (RLD-VSL-00003) at the 2 ft elevation in wet process C5 cell, room L-0126. To detect a leak outside of the primary containment vessels and within the C5 cell, level instrument RLD-LT-2303 monitors the level of effluent in the cell sump. L-0124 process cell west sump pump (RLD-PMP-00027) is stopped on reaching low-low level shut-off point.

Concentrate receipt valve bulge (LCP-BULGE-00003) and melter 2 feed/prep valve bulge (LFP-BULGE-00002), at the 28 ft elevation in the process cell charge floor C3 area, room L-0202, and melter 2 feed line encasement all drain to L-0124 process cell waste disposal east sump (RLD-SUMP-00032). As required, on a semi-automatic basis, this sump is emptied by L-0124 process cell east sump pump (RLD-PMP-00028) to the plant wash vessel (RLD-VSL-00003) at the 2 ft elevation in wet process C5 cell, room L-0126. To detect drain accumulation or leak outside of the primary containment vessels and within the C5 cell, level instrument RLD-LT-2304 monitors the level of effluent in the cell sump. L-0124 process cell east sump pump (RLD-PMP-00028) is stopped on reaching low-low level shut-off point.

Upon reaching process cell waste disposal sump high level, the PCJ system will alert the operator. The operator may then initiate the transfer sequence. Upon reaching the high-high level setpoint, the PCJ system automatically initiates the transfer sequence. Before the sequence proceeds further, the PCJ system calculates the transfer (available) volume to assist the operator not to overflow the selected target vessel available space. The transfer will end when either the level in the sump reaches its low-level functional logic control point, a batch is transferred, or the selected target plant wash vessel (RLD-VSL-00003) reaches its actual high-level batch control point. Additionally, the PCJ system monitors and calculates rate of change of the effluent level. If the rate of change exceeds a predetermined programmed value, the PCJ system will alarm and alert the operator. Figure 2 depicts the instrumentation associated with process cells waste disposal sumps.

3.2.5 Effluent Cell Waste Disposal Sumps

Plant wash/SBS condensate collection vessel valve bulge (RLD-BULGE-00004), at the 28 ft elevation in the process cell charge floor C3 area, room L-0202, drains by through-floor piping back down to L-0126 effluent cell waste disposal east sump (RLD-SUMP-00036). As required, on a semi-automatic basis, this sump is emptied by L-0126 effluent cell east sump pump (RLD-PMP-00032) to the plant wash vessel (RLD-VSL-00003) at the 2 ft elevation in wet process C5 cell, room L-0126. To detect drain accumulation or leak outside of the primary containment vessels and within the C5 cell, level instrument RLD-LT-2308 monitors the level of effluent in the cell sump. L-0126 effluent cell east sump pump (RLD-PMP-00032) is stopped on reaching low-low level shut-off point.

In-cell leaks also accumulate at L-0126 effluent cell waste disposal west sump (RLD-SUMP-00036). As required, on a semi-automatic basis, this sump is emptied by L-0126 effluent cell west sump pump (RLD-PMP-00031) to the plant wash vessel (RLD-VSL-00003) at the 2 ft elevation in wet process C5 cell, room L-0126. In-cell leak outside of the primary containment vessels and within the C5 cell, level

instrument RLD-LT-2307 monitors the level of effluent in the cell sump. L-0126 effluent cell east sump pump (RLD-PMP-00031) is stopped on reaching low-low level shut-off point.

Upon reaching process cells waste disposal sump high level, the PCJ system will alert the operator. The operator may then initiate the transfer sequence. Upon reaching the high-high level setpoint, the PCJ system automatically initiates the transfer sequence. Before the sequence proceeds further, the PCJ system calculates the transfer (available) volume to assist the operator not to overflow the selected target vessel available space. The transfer will end when either the level in the sump reaches its low-level functional logic control point, a batch is transferred, or the selected target plant wash vessel (RLD-VSL-00003) reaches its actual high-level batch control point. Additionally, the PCJ system monitors and calculates rate of change of the effluent level. If the rate of change exceeds a predetermined programmed value, the PCJ system will alarm and alert the operator. Figure 2 depicts the instrumentation associated with process cells waste disposal sumps.

Figure 1 RLD-LT-2205 and RLD-LT-2206 for RLD-VSL-00004

Note: This figure is an update of Figure 1 of 24590-LAW-PER-J-02-001, Rev 0.

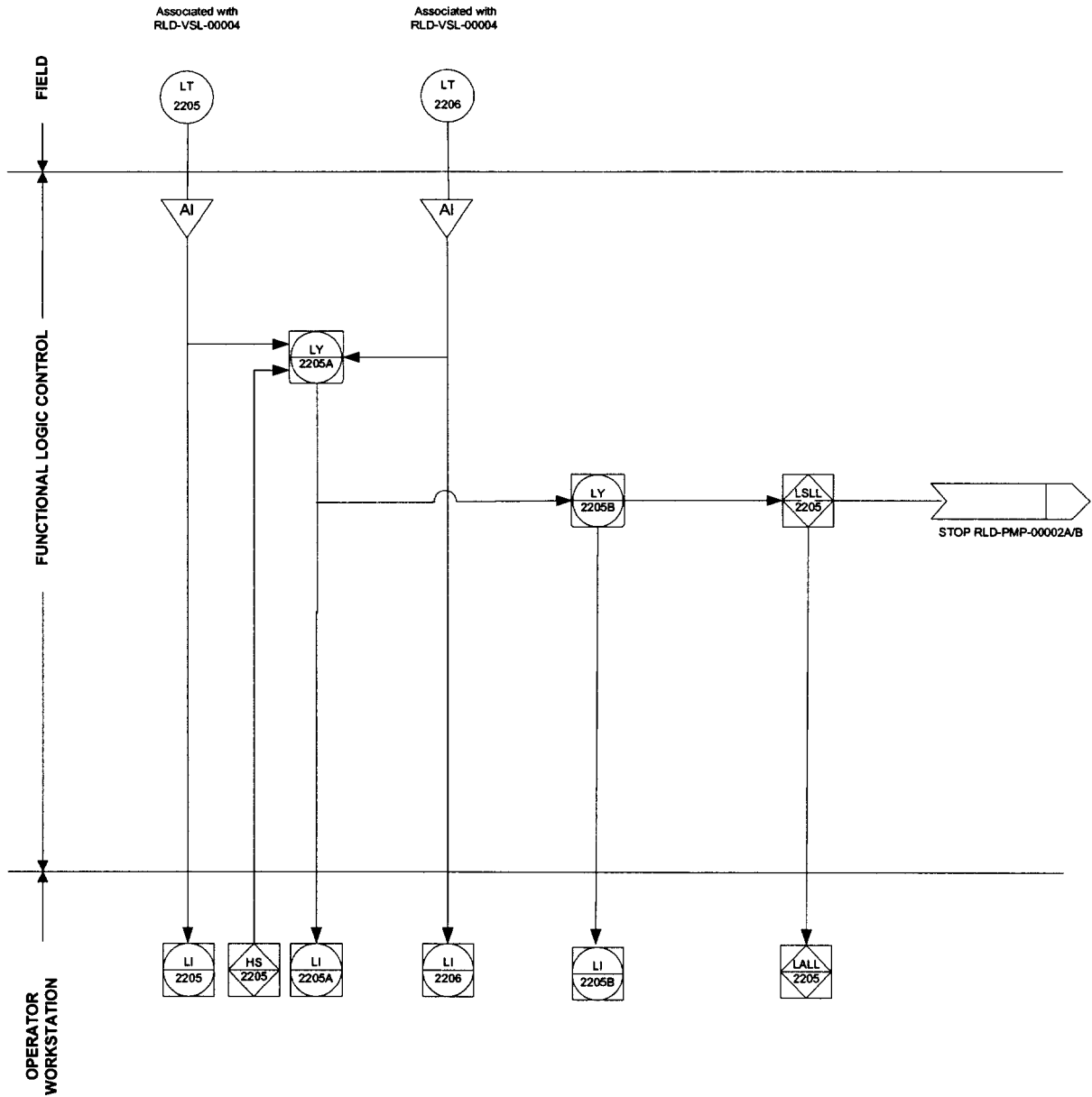
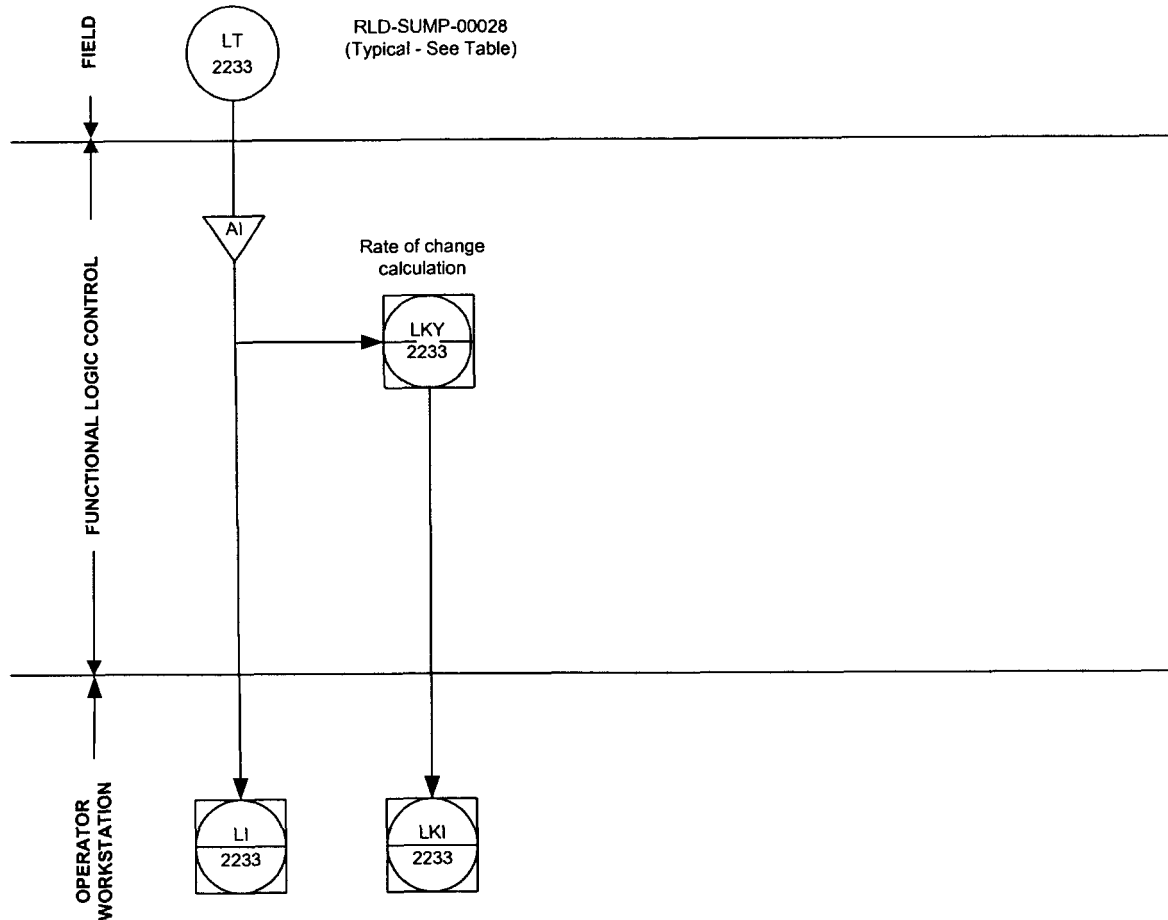


Figure 2 Level for Sumps

Note: This figure is an update of Figure 2 of 24590-LAW-PER-J-02-001, Rev 0.



Sump	LT	LI	LKY	LKI	Pump
RLD-SUMP-00028	RLD-LT-2233	RLD-LI-2233	RLD-LKY-2233	RLD-LKI-2233	RLD-PMP-00004
RLD-SUMP-00029	RLD-LT-2301	RLD-LI-2301	RLD-LKY-2301	RLD-LKI-2301	RLD-PMP-00025
RLD-SUMP-00030	RLD-LT-2302	RLD-LI-2302	RLD-LKY-2302	RLD-LKI-2302	RLD-PMP-00026
RLD-SUMP-00031	RLD-LT-2303	RLD-LI-2303	RLD-LKY-2303	RLD-LKI-2303	RLD-PMP-00027
RLD-SUMP-00032	RLD-LT-2304	RLD-LI-2304	RLD-LKY-2304	RLD-LKI-2304	RLD-PMP-00028
RLD-SUMP-00035	RLD-LT-2307	RLD-LI-2307	RLD-LKY-2307	RLD-LKI-2307	RLD-PMP-00031
RLD-SUMP-00036	RLD-LT-2308	RLD-LI-2308	RLD-LKY-2308	RLD-LKI-2308	RLD-PMP-00032

Figure 3 RLD-LT-2130 and RLD-LT-2131 for RLD-VSL-00003

Note: This figure is in addition to the two figures originally in 24590-LAW-PER-J-02-001, Rev 0.

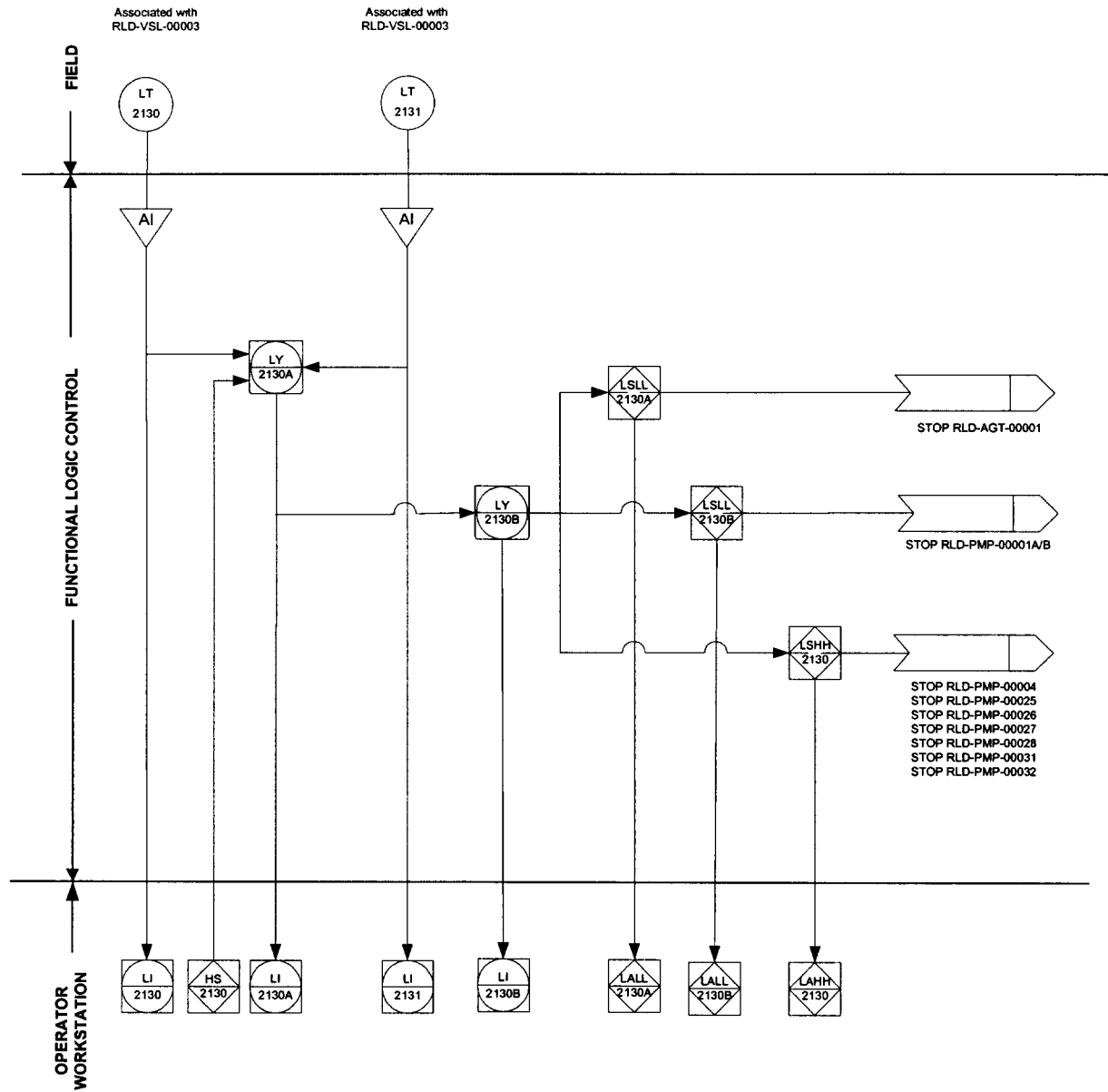


Figure 4 RLD-LT-2142 and RLD-LT-2143 for RLD-VSL-00005

Note: This figure is in addition to the two figures originally in 24590-LAW-PER-J-02-001, Rev 0.

